

CLAIMS

1. Device to compress combustion air, in particular a device to compress combustion
air for a combustion engine of a motor vehicle, with a housing (12), with at least
5 one compressor impeller (30) arranged in a compression area (28) of a first
housing part (14), which is arranged in the flow direction between an air inlet (24)
and an air outlet (43) of the housing (12), as well as with an electric motor (18)
arranged in a second housing part (16) of the housing (12) to operate the
compressor impeller (30), characterized in that a flow channel (42) running in the
10 circumferential direction of the first housing part (12) and connecting the
compression space (28) with the air outlet (43) surrounds the electric motor (18) at
least partially in the axial direction.
2. Device according to Claim 1, characterized in that the flow channel (42) is
15 connected with the electric motor (18) and/or the second housing part (16).
3. Device according to Claim 1 or 2, characterized in that the electronic components
(54), in particular the electronic components of the motor electronics of the
driving electric motor (18) are integrated in such a way in the second housing part
20 (16) that the electronics (54) are cooled predominantly via the flow channel (42).
4. Device according to Claim 2 or 3, characterized in that the second housing part
(16) is comprised at least partially of a heat conducting material.
- 25 5. Device according to Claim 4, characterized in that the second housing part (16)
features a diffuser ring (19), which forms a portion of the limitation of the flow
channel (42) and is thermally coupled to the electric motor (18).
6. Device according to Claim 2, characterized in that the flow channel (42) is
30 essentially embodied in the second housing part (16).
7. Device according to Claim 6, characterized in that the flow channel (42) is
embodied as a single piece with the second housing part.

8. Device according to one of the preceding claims, characterized in that the flow channel (42) is arranged at the high-pressure side of the compressor impeller (30).
- 5 9. Device according to Claim 8, characterized in that the flow channel (42) is arranged on the side of the compressor impeller (30) facing away from the air inlet (24).
- 10 10. Device according to one of the preceding claims, characterized in that the flow channel (42) features a cross-section that widens in the circumferential direction of the housing (12).
- 15 11. Device according to Claim 10, characterized in that the flow channel (42) features an essentially elliptical cross-section, whereby the large semiaxis of the ellipse runs essentially parallel to the drive shaft (46) of the electric motor (18).
- 20 12. Device according to one of the preceding claims, characterized in that the flow channel (42) can be connected with the air inlet (24) of the housing (12) via a bypass channel (62) bypassing the compressor impeller (30).
- 25 13. Device according to Claim 12, characterized in that means (64, 68) are provided to close the bypass channel (62) with an activated electric motor (18).
- 30 14. Device according to Claim 13, characterized in that the means (64, 68) are self-setting.
15. Device according to Claim 13 or 14, characterized in that the means (64, 68) are air driven.
16. Device according to one of the preceding Claims 12 through 15, characterized in that the means (70), in particular elastic means, are provided to open the bypass channel (62) with a deactivated electric motor (18).